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cases of yellow fever to develop, which must occur unless the crews are immunes. The weather conditions are most unfavorable, intense heat during the greater part of the day, followed by heavy rains which now fail to cool the atmosphere.

The direct rays of the sun are almost unbearable when the trade winds are not blowing.

Very respectfully,
W. F. BRUNNER,
Sanitary Inspector, U. S. M. H. S.

The SURGEON-GENERAL,
U. S. Marine-Hospital Service.

[Inclosure.]

Comparative statistics of the mortality of the city of Habana for the weeks ended July 15, July 22, July 29, August 5, August 12 and August 19, 1897.

Disease.	Week ended—					
	July 15.	July 22.	July 29.	Aug. 5.	Aug. 12.	Aug. 19.
Yellow fever	41	48	40	28	23	27
Enteric fever	11	14	17	21	20	22
Pernicious fever	10	6	14	14	13	8
Paludal fever	2	3	3	2	7	7
Dysentery	9	22	21	23	39	24
Enteritis	12	23	30	42	36	32
Smallpox	1	3	0	0	0	0
Glanders	1		1	1	1	0
Diphtheria		1	1	1	1	0
Pneumonia	6	3	3	3	14	11
Tuberculosis	29	28	32	38	31	46
From all causes	235	264	284	306	317	342
Annual ratio per 1,000	61.10	68.64	73.64	79.56	82.42	88.90

GERMANY.

Method of testing antidiphtheritic serum in Berlin.

BERLIN, GERMANY, *August 5, 1897.*

SIR: I have the honor to submit the following observations upon the methods employed in Berlin in the testing of antidiphtheritic serum, which present some points which seem worthy of note, as illustrating the great care taken in the procedure, and improvements which have been made as the result of experience. For the information and the privilege of making the observations I am indebted to Dr. Bonhoff, who has charge of the testing of all serums made under the direction of Professor Behring, whose establishment supplies by far the larger portion of serums used in the German Empire, besides a large export demand. The general principle involved is of course the simultaneous injection of given quantities of diphtheria toxines and antitoxines. The former are prepared by cultivating in bouillon a virulent growth of the Klebs-Loeffler bacillus. The potency of these toxines is determined by blank experiments upon susceptible animals, usually guinea pigs. A departure from the generally accepted practice is the preparation of these toxines in large quantities, which are kept in flasks in a dark and cool place, a quantity of thymol being added to prevent the growth of adventitious germs which may find their way into the liquid after it has been subjected to filtration through a Pasteur-Chamberland filter. The thymol floats in a layer upon the surface of the liquid, and is removed from beneath this layer by a sterilized pipette in the usual manner.

The serums come from the stables in vials, sealed and marked with their reputed strength in immunizing units, according to the method of Behring, and contain sufficient antiseptic, trikresol or carbolic acid, to prevent decomposition. From the time that the bleeding is performed until the claims of potency have been verified the product is under official supervision, and every care is taken to prevent imposition and to guard against accidental contamination.

The test is as follows: One hundred times a minimal fatal dose of the toxines are measured. To this is added a quantity of the antitoxines sufficient to neutralize them as calculated from the claimed potency, whether in 100 or 200 immunizing units, the two strengths usually claimed. Of this mixture one-tenth is administered by subcutaneous injection, particular care being taken not to penetrate deeply beyond the subcutaneous tissue in making the injection. If the result of the experiment does not justify the claims, further experiments are made with reduced quantities until the exact value of the serum in terms of toxines is arrived at, and it is claimed for the method that a variation of 5 per cent in the strength of the serums can be detected by observing the reaction of the animals. The experiments are made in duplicate by independent observers, and the results must accord within a certain very narrow limit, and no serum is passed officially which falls more than 5 per cent below the claimed strength. I am informed that it is not infrequent to reject large batches of serum on this account. Further tests are then made with a view of determining the purity of the product. Of course it must contain no diphtheria bacilli, to determine which special plants are made upon blood serum and agar-agar, the tubes containing which are put in the thermostat and there kept for seventy-two hours. Cultures are also made in bouillons of various compositions and if any bacterial growth makes its appearance in the abovementioned time, the lot of serum which the sample represents is rejected. Formerly it was allowed that the serum should show a growth of a limited number of nonpathogenic organisms, but as absolute bacterial purity was regarded as only a matter of perfection of technique, the above rigorous requirement was adopted. It will thus be seen that the preparation of the antidiphtheritic serum is a process demanding great care, and which has been brought to a high degree of perfection under the present arrangement.

It may be interesting here to compare the practice of the Pasteur Institute with that as conducted above. At the institute the bleeding of the animals is conducted under the most rigorous aseptic conditions; the blood is received in vessels previously sterilized by heat, and the separation of the clot from the serum takes place in a special apartment kept at a uniform temperature and in a condition of absolute surgical cleanliness. It is carefully tested, and the potency is expressed in a manner differing from that of Behring, being based upon the number of grams of guinea pig which are protected against a fatal dose of diphtheria toxines by 1 cubic centimeter of the serum. The strength determined, the serum is either dried in vacuo and marketed in this form, or, being put into special distributing and filling apparatus, which is a marvel of ingenuity, it is then distributed into small, previously sterilized vials. Special stress is laid upon the fact that the serum is sterile from the care taken in all manipulations and not from the addition of any chemical germicidal agent. Both plans have their advantages and disadvantages, it seems to me. If the antiseptic is added the serum is converted into a liquid unfavorable for bacterial growth, but the potency of the antitoxin is diminished, by just how much is, as yet, not accurately determined. On the contrary, without the addition of the germicide, the antitoxines are preserved in all their purity and potency, but the process is open to the objection that if only a part of the contents of a flask is withdrawn for use the remainder is apt to become contaminated by the accidental introduction of bacteria through faulty technique or improperly cleaned instruments.

I am not now prepared to express an opinion on the merits of the case, but would suggest that the determination of the diminution of potency by the addition of chemical agents would be a study of value. I am deeply impressed with the belief that the toxines and antitoxines are bodies of such delicate composition and so prone to decomposition and deterioration, that every manipulation not actually demanded is better avoided; therefore, until convinced to the contrary, I would prefer, on general principles, to give my adherence to the Paris plan.

I have the honor to remain, sir,

Very, respectfully, yours, H. D. GEDDINGS,
Passed Assistant Surgeon, U. S. M. H. S.

The SURGEON-GENERAL,
U. S. Marine-Hospital Service.

NICARAGUA.

Quarantine at San Juan del Norte.

SAN JUAN DEL NORTE, *July 30, 1897.*

SIR: Referring to my dispatch, No. 395, of the 22d instant, relative to quarantine at Limon, Costa Rica, I have the honor to report as follows:

The Colombian sloop *Whisper* arrived here to-day from Colon, having touched at Bocas del Toro and Limon. There was 1 passenger, a woman. The sloop was boarded by the health officer about 2 miles from the town. The crew reported the prevalence of yellow fever at Limon. The master was ordered to remain in the lagoon, about a mile from town, and not suffer any of the crew to land until further orders. The woman passenger was ordered to remain in a building near the harbor entrance and about a mile from town for a period of seven days.

I am, sir, your obedient servant, THOMAS O'HARA,
United States Consul.

Hon. ASSISTANT SECRETARY OF STATE.

UNITED STATES OF COLOMBIA.

Vessels clearing from Colombian ports required to take bill of health from local medical officer.

CARTAGENA, *July 30, 1897.*

SIR: I have the honor to report that I have been officially notified by the governor of this department, Hon. Edward B. Gerlein, that in accordance with authority received by him for the purpose from the executive department in Bogota, it will, hereafter, be made compulsory on all vessels, prior to receiving their clearance papers from the port authorities, to take out a bill of health from the local medical officer. This bill of health is to be similar in form to that in use by Colombian consuls in foreign ports. It will certify as to the general sanitary con-